REMARKS

This Amendment is responsive to the Office Action mailed March 15, 2010. With this amendment, claims 8-9 and 16-19 have been amended, and claims 36-37 have been added. Claims 1-37 are pending; claim 1-17 and 20-35 are withdrawn as directed to non-elected subject matter. Claims 18-19 are under consideration. Applicants submit that new claims 36-37 are directed to the elected subject matter.

Support for the instant Amendment, including new claims 36-37, can be found throughout the specification as filed, e.g., at page 16, lines 14-17 and page 18, lines 10-15.

The foregoing amendment also inserts trademark names in capital letters accompanied by the generic terminology.

No new matter has been added.

Reconsideration and withdrawal of the rejections made in the above-referenced Office Action are respectfully requested in view of the following remarks.

Requirement for Restriction

The Office Action states that claims 1-17 and 20-25 are withdrawn as being drawn to non-elected subject matter.

In response, Applicants submit that new claims 26-27 are directed to elected subject matter. In addition, Applicants allow claims 1-17 and 20-25 to remain pending subject to possible rejoinder at the Examiner's discretion. In particular, Applicants respectfully request rejoinder of claim 9, which claim is directed to an amino acid sequence encoded by the DNA of claim 18, as well as claims 8 and 16-17, which claims, like those of elected claims 18-19, are directed to a fluorescent protein and DNA encoding a fluorescent protein from *Acropora* species.

Information Disclosure Statement

The Office Action acknowledges receipt of the Information Disclosure Statements of September 1, 2009; February 6, 2007; and August 17, 2006. The Office Action states however, that the Information Disclosure Statement (IDS) of September 1, 2009, has not been considered because the non-patent literature citations do not include titles.

In response, Applicants thank the Examiner for acknowledging receipt of the Information Disclosure Statements of September 1, 2009; February 6, 2007; and August 17, 2006. Applicants also thank the Examiner for consideration of the documents in the Information Disclosure Statements of February 6, 2007 and August 17, 2006. With regard to the IDS of September 1, 2009, Applicants submit herewith an IDS listing those documents not previously made of record therein. In particular, Applicants note that two of the documents which were lined through in said IDS were nevertheless made of record in the Form PTO-892 attached to the Office Action, i.e., Karasawa et al., *Biochem J.* **381**:307-312, 2004 and Papina et al., *Comparative Biochemistry and Physiology* Part B **131**:767-774, 2002. Accordingly, these documents have not been listed in the IDS attached hereto. Applicants respectfully request the Examiner to consider the attached IDS and to indicate such consideration by returning a signed and initialed copy of the Form PTO-1449 to the undersigned.

Objection to the Specification

The Office Action objects the specification for use of the tradmarks MILLI-Q, TRIZOL, TAQ, and PYROBEST, without capitalization of the same. The Office Action also states that wherever the trademarks appear, they should be accompanied by the generic terminology.

In response, Applicants submit that the foregoing amendment inserts trademark names in capital letters accompanied by the generic terminology, as required. Accordingly, Applicants respectfully request reconsideration of the objection to the Specification, and withdrawal of the same.

Claim Objections

The Office Action objects claim 18 for recitation of "DNA which has an amino acid sequence...".

In response, Applicants submit that the foregoing amendment is responsive to the instant objection. In particular, Applicants note that the claim 18 has been amended in accordance with the Examiner's suggestion and now recites, *inter alia*, "DNA encoding an amino acid sequence." Accordingly, Applicants respectfully request reconsideration of the claim objection and withdrawal of the same.

Claim Rejections 35 U.S.C. § 101

The Office Action rejects claims 18-19 under 35 U.S.C. § 101 as allegedly directed to non-statutory subject matter. In particular, the rejection asserts that claim 18-19 encompass DNA found in *Acropora* sp., and which DNA is therefore a product of nature.

In response, and without acquiescing to the propriety of the rejections, Applicants submit that the claimed subject matter is directed to statutory subject matter. In particular, Applicants submit that claims 18-19 have been amended solely to advance prosecution, and such that they are now directed to "isolated" DNA in accordance with the Examiner's suggested language.

Accordingly, Applicants respectfully request reconsideration of the rejections under 35 U.S.C. 101, and withdrawal of the same.

Claim Rejections 35 U.S.C. § 112, First Paragraph, Written Description

The Office Action also rejects claims 18-19 under 35 U.S.C. § 112, first paragraph, as allegedly failing to comply with the written description requirement. In particular, the Action alleges that the claims are directed to an unlimited number of substitutions, deletions and

additions to SEQ ID NOs: 6 and 8 (Office Action at page 5, lines 9-10). The rejection further alleges that disclosure of SEQ ID NOs: 6 and 8 (which encode SEQ ID NOs: 5 and 7, respectively) is not representative of the genus of DNAs claimed.

In response, and without acquiescing to the propriety of the rejection, Applicants submit that the claimed subject matter is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Initially, Applicants submit that the claims are directed to, *inter alia*, a DNA encoding an amino acid sequence comprising a deletion, substitution, and/or addition of *one to ten* amino acids with respect to the amino acid sequence shown in SEQ ID NO: 5 or 7, and which encodes a fluorescent protein. The claims are also directed to, *inter alia*, DNA which has a nucleotide sequence comprising a deletion, substitution, and/or addition of *one to thirty* nucleotides with respect to the nucleotide sequence shown in SEQ ID NO: 6 or 8, and which encodes a fluorescent protein. Thus, the claims are not directed to an unlimited number of substitutions, deletions and additions to SEQ ID NOs: 6 and 8, as the rejection asserts. Instead the claims are directed, *inter alia*, to DNA encoding variants of SEQ ID NO: 5 or 7 having at least 95% identity (SEQ ID NO: 5 or 7 = 232 amino acids; 222/232 = 95.7 %) to SEQ ID NO: 5 or 7, and which encode proteins which are fluorescent.

Furthermore, Applicants submit that the specification discloses the full length amino acid and nucleic acid structures for at least three different sequences from *Acropora* species: MIG (SEQ ID NOs: 3 and 4), MICy (SEQ ID NOs: 5 and 6), MiCy2 (SEQ ID NOs: 7 and 8) (see, e.g., Examples 2-3 on pages 36-49). Thus, Applicants submit that the specification describes a representative number of species within the claimed genus to describe the variation within the claimed genus.

Applicants further submit that the "Background Art" section of the specification discloses that various GFP mutants changed in color, having improved folding properties, enhanced luminance, or modified pH sensitivity are known and have been prepared based on random mutagenesis techniques and semi-rational mutagenesis techniques. Applicants further submit

that the "specification need only describe in detail that which is new or not conventional" MPEP 2163, citing *Hybritech v. Monoclonal Antibodies*, 802 F.2d at 1384, 231 USPQ at 94; *Fonar Corp. v. General Electric Co.*, 107 F.3d at 1549, 41 USPQ 2d at 1805. Thus, Applicants submit that the Specification need not describe in detail each and every position within each and every member of the claimed genus of DNAs which can be deleted, substituted, or added, in order for the skilled artisan to reasonably conclude that Applicants were in possession of the genus of DNAs claims at the time the application was filed.

Based at least on the foregoing, Applicants submit that claim 18-19 do comply with the written description requirement, and that the claimed subject matter is described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. Accordingly, Applicants respectfully request reconsideration of the rejection under 35 U.S.C. § 112, first paragraph (written description), and withdrawal of the same.

Claim Rejections – 35 U.S.C. § 102

The Office Action rejects claims 18-19 under 35 U.S.C. § 102(a) as allegedly anticipated by Karasawa et al. (*Biochem. J.* **381**:307-312, 5 April 2004; hereinafter "Karasawa").

In response, and without acquiescing to the propriety of the rejection, Applicants submit the claimed subject matter is not anticipated by Karasawa. In particular, Applicants draw the Examiner's attention to a verified English language translation of the Japanese priority application JP 2003-170326, submitted herewith, to perfect the claim of foreign priority. In particular, Applicants note that Karasawa is utilized in the rejection as alleged 102(a) prior art apparently based upon its April 5, 2004 publication date. Applicants further note that this publication date is subsequent to the June 16, 2003 filing date of Applicants' foreign priority document. Accordingly, Applicants respectfully request the Examiner to consider the translation of the priority document for its impact on the present rejection under 102(a).

Based at least on the foregoing, Applicants submit that the claimed subject matter is not anticipated by Karasawa. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(a).

The Office Action also rejects claims 18-19 under 35 U.S.C. § 102(e) as allegedly anticipated by Matz et al. (U.S. Patent No. 7,160,698; hereinafter "Matz").

In response, and without acquiescing to the propriety of the rejection, Applicants submit the claimed subject matter is not anticipated by Matz. In particular, Applicants draw the Examiner's attention to a verified English language translation of the Japanese priority application JP 2003-170326, submitted herewith, to perfect the claim of foreign priority. In particular, Applicants note that Matz is utilized in the rejection as alleged 102(e) prior art apparently based upon its May 20, 2004 filing date. Applicants further note that the May 20, 2004 filing date is subsequent to the June 16, 2003 filing date of Applicants' foreign priority document. Accordingly, Applicants respectfully request the Examiner to consider the translation of the priority document for its impact on the present rejection under 102(e).

Applicants further note that US 60/472,196, the provisional application to which Matz claims priority, does not disclose nucleotide and/or amino acid sequences derived from *Acropora* species. Instead, US 60/472,196 discloses sequences derived from *Montastraea* and *Scolymia* species. However, US 60/472,196 does not disclose proteins/nucleic acids derived from *Acropora* species.

Furthermore, Matz fails to disclose at least one sequence which encodes a protein with as much as 95% identity to SEQ ID NO: 5 or 7. Accordingly, Applicants submit that the claimed subject matter is not anticipated by Matz.

Based at least on the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 102(e).

The Office Action also rejects claims 18-19 under 35 U.S.C. § 102(e) as allegedly anticipated by each of the following patents or publications, which for the sake of brevity, are addressed together herein:

U.S. Patent No. 7,060,869;

U.S. Patent No. 7,226,993;

U.S. Patent No. 7,345,157;

U.S. Patent No. 7,504,491;

U.S. Patent No. 7,541,451;

U.S. Patent No. 7,547,258;

U.S. Patent No. 7,375,201; and

U.S. Patent App. Pub. No. 2005/0208624.

In response, and without acquiescing to the propriety of the rejection, Applicants submit the claimed subject matter is not anticipated by any of the above-listed patents or publications. In particular, Applicants submit that the claimed subject matter is directed, *inter alia*, to "[a]n isolated DNA of either the following (a) or (b):

(a) DNA encoding an amino acid sequence shown in SEQ ID NO: 5 or 7; or

(b) DNA encoding an amino acid sequence comprising a deletion, substitution, and/or addition of one to ten amino acids with respect to the amino acid sequence shown in SEQ ID NO: 5 or 7, and which encodes a fluorescent protein." The claimed subject matter is also directed, *inter alia*, to "[a]n isolated DNA having either the following nucleotide sequence (a) or (b):

(a) a nucleotide sequence shown in SEQ ID NO: 6 or 8; or

(b) a nucleotide sequence which comprises a deletion, substitution, and/or addition of one to thirty nucleotides with respect to the nucleotide sequence shown in SEQ ID NO: 6 or 8, and which encodes a fluorescent protein."

Applicants submit that U.S. Patent No. 7,060,869; U.S. Patent No. 7,226,993; U.S. Patent No. 7,345,157; U.S. Patent No. 7,504,491; U.S. Patent No. 7,541,451; U.S. Patent No. 7,547,258; U.S. Patent No. 7,375,201; and U.S. Patent App. Pub. No. 2005/0208624 fail to disclose such DNAs. Accordingly, Applicants submit that the claimed subject matter is not anticipated by any of U.S. Patent No. 7,060,869; U.S. Patent No. 7,226,993; U.S. Patent No. 7,345,157; U.S. Patent No. 7,504,491; U.S. Patent No. 7,541,451; U.S. Patent No. 7,547,258; U.S. Patent No. 7,375,201; or U.S. Patent App. Pub. No. 2005/0208624.

Based at least on the foregoing, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 102(e).

The Office Action also rejects claims 18-19 under 35 U.S.C. § 102(b) as allegedly anticipated by U.S. Patent No. 5,998,204.

In response, Applicants submit that the claimed subject matter is not anticipated by U.S. Patent No. 5,998,204 for at least the reasons set forth above with respect to rejection of claim 18-19 under 35 U.S.C. § 102(e) over U.S. Patent Nos. 7,060,869; 7,226,993; 7,345,157; 7,504,491; 7,541,451; 7,547,258; 7,375,201; and U.S. Patent App. Pub. No. 2005/0208624.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 102(b).

The Office Action also rejects claims 18-19 under 35 U.S.C. § 102(a) and (e) as allegedly anticipated by U.S. Patent No. 6,627,449.

In response, Applicants submit that the claimed subject matter is not anticipated by U.S. Patent No. 6,627,449 for at least the reasons set forth above with respect to rejection of claims 18-19 under 35 U.S.C. § 102(e) over U.S. Patent Nos. 7,060,869; 7,226,993; 7,345,157; 7,504,491; 7,541,451; 7,547,258; 7,375,201; and U.S. Patent App. Pub. No. 2005/0208624.

Furthermore, Applicants respectfully request the Examiner to consider the translation of the priority document, filed concurrently herewith, for its impact on the present rejection.

Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejections under 35 U.S.C. § 102(a) and (e).

Claim Rejections – 35 U.S.C. § 103

The Office Action rejects claims 18-19 under 35 U.S.C. § 103(a) as allegedly unpatentable over Papina et al. (*Comparative Biochemistry and Physiology Part B* **131**:767-774, 2002; hereinafter "Papina") in view of Gibbs et al. (U.S. 2004/0110225; hereinafter "Gibbs"). In particular, the Examiner asserts that "[g]iven the spectral properties of the proteins reported by Papina et al. are substantially the same as those reported in the instant specification for SEQ ID NOs: 5 and 7, and given that the proteins taught by Papina et al. and instant SEQ ID NOs: 5 and 7 are all from Acropora, there is a reasonable expectation that Papina et al. in fact teach proteins of SEQ ID NOs 5 and 7. (See Office Action at page 11, 2nd full paragraph).

In response, and without acquiescing to the propriety of the rejection, Applicants submit that the molecular weights of the proteins disclosed at page 772 of Papina (115 kDa to 200 kDa) are larger than the molecular weight of the MiCy protein (59.7 kDa), which protein is included among those proteins encoded by the claimed subject matter. Furthermore, Papina teaches that the molecular masses did not change with treatment with 2.5% SDS, and that the protein masses therefore reflect *monomer* mass. Applicants further submit that proteins having a smaller molecular weight are advantageous when used, e.g., as tags for labeling. Accordingly, Applicants submit that the claimed subject matter is not obvious over the cited art at least because the proteins encoded by the DNA as claimed are not of the same mass as those disclosed by Papina.

Applicants also submit that the spectral properties of the proteins taught by Papina are not the same as those encoded by the claimed subject matter. For example, the excitation peaks and emission peaks of the proteins of Papina are different from those of the present invention. Indeed, comparison of any set of major peaks of the excitation and/or emission wavelengths,

shows that the major peaks are different, and thus, that the proteins of Papina are different from those encoded by the presently claimed subject matter. Therefore, insofar as the excitation spectra and fluorescent spectra, including any set of major peaks of the excitation and/or emission wavelengths, are different from those encoded by the presently claimed subject matter, Applicants submit that the claimed subject matter is not obvious over the combination of Papina in view of Gibbs.

Applicants also submit that the wavelength of the major peak of *excitation* for some of the Papina proteins is longer than the wavelength of the major peak of fluorescence (emission) (see, for example, Papina at Fig. 4(d), 4(e), and 4(f)). This suggests that the proteins of Papina may have chromophores which emit several types of fluorescence. However, with MiCy of the present invention, for example, the wavelength of the major peak of fluorescence (emission) is longer than the wavelength of the major peak of excitation.

Applicants further submit that at least SEQ ID NO: 7 is not the same as that disclosed in Papina, insofar as SEQ ID NO: 7 is a man-made mutant of SEQ ID NO: 5 as disclosed in the specification at page 49, Section (10). Thus, even assuming *arguendo* that the proteins disclosed in Papina were isolated from the same species as the that for SEQ ID NO: 5, SEQ ID NO: 7 would not be the same as any of the proteins disclosed in Papina.

Based at least on the foregoing, Applicants submit that the claimed subject matter is not obvious over the combination of Papina in view of Gibbs. Accordingly, Applicants respectfully request reconsideration and withdrawal of the rejection under 35 U.S.C. § 103(a).

Obviousness-Type Double Patenting

The Office Action rejects claims 18-19 on the ground of nonstatutory obviousness-type double patenting as allegedly unpatentable over each of the following patents, which for the sake of brevity, are addressed together:

Claims 1-21 of U.S. Patent No. 5,998,204;

Claims 1-27 of U.S. Patent No. 6,627,449;

Claims 1-27 of U.S. Patent No. 7,060,869;

Claims 1-8 of U.S. Patent No. 7,226,993;

Claims 10-16 of U.S. Patent No. 7,247,449;

Claims 1-9 of U.S. Patent No. 7,375,201;

Claims 1-4 of U.S. Patent No. 7,345,157;

Claims 1-9 of U.S. Patent No. 7,504,491;

Claims 1-8 of U.S. Patent No. 7,541,451; and

Claims 1-9 of U.S. Patent No. 7,547,528.

In particular, the Office Action asserts that although the conflicting claims are not identical, they are not patentably distinct from each other because each of the above patents claim DNA encoding a fluorescent protein that "must include at least one substitution, deletion or addition with respect to instant SEQ ID NOs: 5 or 7" (see, e.g., Office Action at page 14, Section 21).

In response, Applicants respectfully submit that the claims of the present application are not obvious in view of the claims of any of the above-listed patents. In particular, Applicants submit that the claimed subject matter is directed, *inter alia*, to "[a]n isolated DNA of either the following (a) or (b):

(a) DNA encoding an amino acid sequence shown in SEQ ID NO: 5 or 7; or

(b) DNA encoding an amino acid sequence comprising a deletion, substitution, and/or addition of one to ten amino acids with respect to the amino acid sequence shown in SEQ ID NO: 5 or 7, and which encodes a fluorescent protein." The claimed subject matter is also directed, *inter alia*, to "[a]n isolated DNA having either the following nucleotide sequence (a) or (b):

(a) a nucleotide sequence shown in SEQ ID NO: 6 or 8; or

(b) a nucleotide sequence which comprises a deletion, substitution, and/or addition of one to thirty nucleotides with respect to the nucleotide sequence shown in SEQ ID NO: 6 or 8, and which encodes a fluorescent protein." Accordingly, Applicants submit that the claims subject matter is not obvious over the claims of any of the above-listed patents.

In this regard, Applicants respectfully request the Examiner to reconsider the obviousness-type double patenting rejections in view of the present amendments.

Based at least on the foregoing, Applicants respectfully request that the Examiner reconsider the rejection of claims 18-19 on the ground of nonstatutory obviousness-type double patenting as allegedly unpatentable over the above-listed claims of the above-listed patents, and that the Examiner withdrawal the same.

The Office Action provisionally rejects claims 18-19 on the ground of nonstatutory obviousness-type double patenting as allegedly unpatentable over each of the following copending applications, which for the sake of brevity, are addressed together:

Claims 14-19 of U.S. Patent App. No. 11/042,158;

Claims 7-10 and 13-18 of U.S. Patent App. No. 11/569,275;

Claims 8 and 11-13 of U.S. Patent App. No. 10/561,040;

Claims 4-6 of U.S. Patent App. No. 12/569,464;

Claims 1-6 of U.S. Patent App. No. 12/463,271; and

Claims 4, 7, 10, 11, and 18 of U.S. Patent App. No. 10/581,551.

In particular, the Office Action asserts that although the conflicting claims are not identical, they are not patentably distinct from each other because each of the above applications claim DNA encoding a fluorescent protein that "must include at least one substitution, deletion

or addition with respect to instant SEQ ID NOs: 5 or 7" (see, e.g., Office Action at page 14, Section 21).

In response, Applicants respectfully submit that the claims of the present application are not obvious in view of the claims of any of the co-pending applications. In particular, Applicants submit that the claimed subject matter is directed, *inter alia*, to "[a]n isolated DNA of either the following (a) or (b):

(a) DNA encoding an amino acid sequence shown in SEQ ID NO: 5 or 7; or

(b) DNA encoding an amino acid sequence comprising a deletion, substitution, and/or addition of one to ten amino acids with respect to the amino acid sequence shown in SEQ ID NO: 5 or 7, and which encodes a fluorescent protein." The claimed subject matter is also directed, *inter alia*, to "[a]n isolated DNA having either the following nucleotide sequence (a) or (b):

(a) a nucleotide sequence shown in SEQ ID NO: 6 or 8; or

(b) a nucleotide sequence which comprises a deletion, substitution, and/or addition of one to thirty nucleotides with respect to the nucleotide sequence shown in SEQ ID NO: 6 or 8, and which encodes a fluorescent protein." Accordingly, Applicants submit that the claims subject matter is not obvious over the claims of any of the above-listed co-pending applications.

In this regard, Applicants respectfully request the Examiner to reconsider the provisional obviousness-type double patenting rejection in view of the present amendments.

Based at least on the foregoing, Applicants respectfully request that the Examiner reconsider the provisional rejection of claims 18-19 on the ground of nonstatutory obviousness-type double patenting as allegedly unpatentable over the above-listed claims of the above-listed co-pending applications, and that the Examiner withdrawal the same.

CONCLUSION

In view of the foregoing remarks and amendments, Applicants respectfully submit that the claims are in condition for allowance.

No fee is believed due at this time. However, the Office is authorized to charge any required fee to Deposit Account No. 19-0089.

If there should be any questions, the Examiner is invited to contact the undersigned at the telephone number listed below.

Respectfully Submitted,
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